

# Portable Ham Radio

**An introduction to operating amateur radio outside**

Presented to the:  
*Athens Radio Club*



Presented by:

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Date: August 3, 2021



# Thanks for attending, ham radio is fun and we enjoy sharing the hobby with others!



CQ Amateur Radio Magazine – Feb 2020



HAM NATION Show with Dr. Bob Heil



HAM RADIO DX Show with VK7HH



Red Summit RF with NJ7V



# Amateur radio is better in the great outdoors!



# Agenda

## Tips & Hints

- How not to operate portable ham radio
- What is the difference between mobile and portable ham radio?
- Why is portable ham radio so much fun?
- Why is portable ham radio an important skill?
- Planning your portable mission
- Getting to your portable operating location
- Portable radios & power
- Portable antennas
- Developing your RF awareness

## Examples

- Deployment scenario – SOTA (Blood Mtn)
- Deployment scenario – SOTA/POTA (BRM)
- Deployment scenario – POTA (FDR)
- Deployment scenario – ARRL Field Day (20)
- Deployment scenario – ARRL Field Day (21)
- Deployment scenario – POTA (Arches)
- Deployment scenario – SOTA (Iron Mt, UT)
- Deployment scenario – Listening Post
- Deployment scenario - Fox Hunting
- Selected QRP Ham Radio Portable Contacts
- Suggested resources
- Thank You!



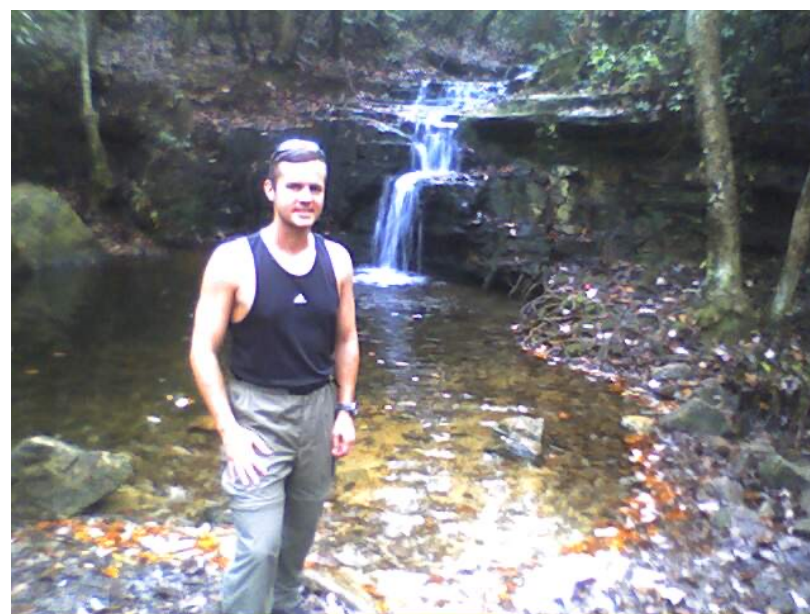
# How not to operate portable ham radio

Deployment scenario – ARRL 2004 Fall Sweepstakes

November 20, 2004 – Pine Mountain, Wolfden Loop (7 miles hike)

KI4ASK & AG4ZR

Yaesu FT-897, Icom IC-703, and a *Marine Battery* + 2 *Sealed Lead Acid batteries*!





# What is the difference between mobile and portable ham radio?

## MOBILE

- Operating from a vehicle
- Radio equipment in the vehicle
- Antenna fixed to the vehicle
- Maritime mobile via boat
- Aeronautical mobile via aircraft



Source: KC0VGR

## PORTABLE

- Operating from a temporary location usually outdoors
- Radio equipment is setup for short-term operations
- Antenna is quickly deployed
- Almost always involves compromises of efficiency vs. effectiveness





# Why is portable ham radio so much fun?

- Being outdoors enjoying the fresh air and scenery
- Less interference from electrical noise sources
- Challenge of deploying a totally self-sufficient radio station
- New and innovative portable radios (e.g. IC-705, Elecraft KX2)
- Fun outdoor operating events and contests like POTA & SOTA
- The satisfaction of making contacts from austere conditions
- The physical exercise of walking to and setting up your station
- The mental exercise of planning and deploying your station
- Ability to practice emergency communications in the field
- Thrill of taking your shack with you
- Making contacts you wouldn't have otherwise made from home
- Sharing the hobby with members of the general public
- *ARRL Field Day is one of the most well-loved portable operating activities, but there's no need to only do that once a year!*





# Why is portable ham radio an important skill?

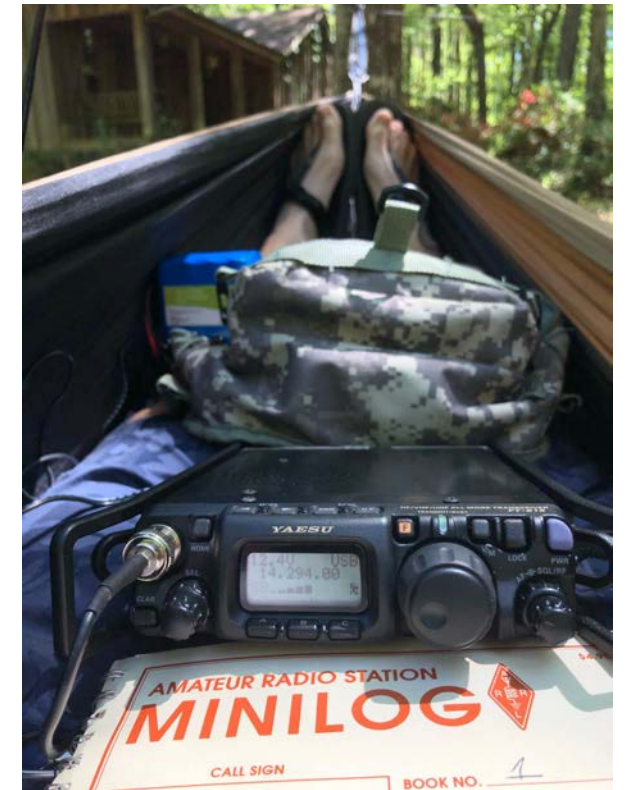
- Developing “radio frequency awareness” around you MW, HF, VHF, UHF
- Search & rescue operations
- Public service missions
- Ability to deploy in austere conditions
- Radio direction finding “fox hunting”
- Field listening post / Stealth scanning
- Developing radio self-sufficiency and resilience
- Improving knowledge about propagation in varied terrain and locations
- Improved DX capabilities away from RF noise sources





# Planning your portable mission

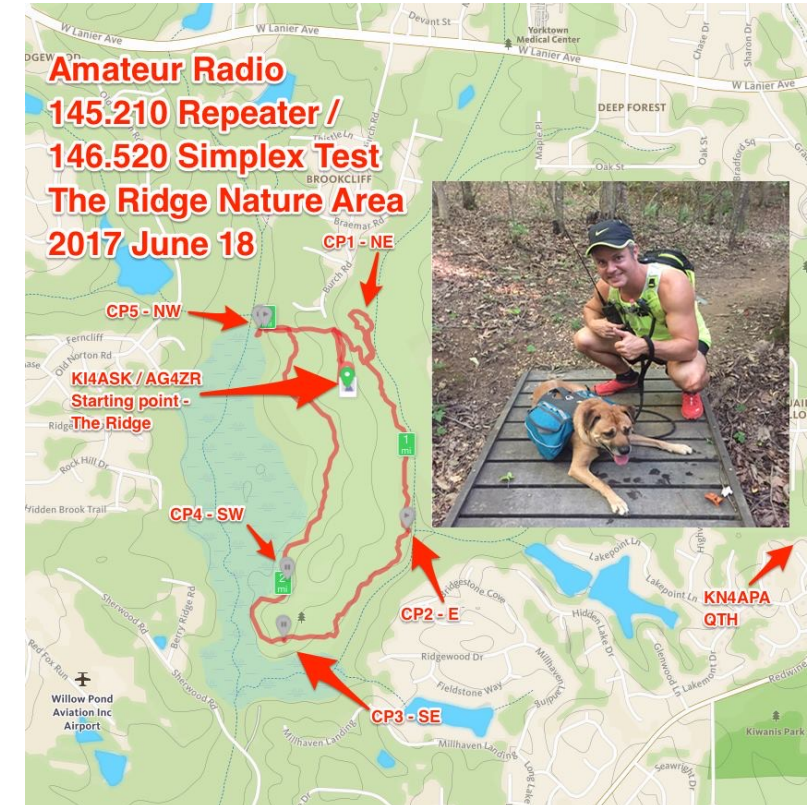
- Location – park, trail, mountain, water, backyard, etc.
- Route – road, trail, path, cross-country
- Weather – check forecast, but be prepared for anything
- Supplies – food, water, shelter, first aid, 10 essentials
- Operating gear – radio, antenna, power, computer, log





# Getting to your portable operating location

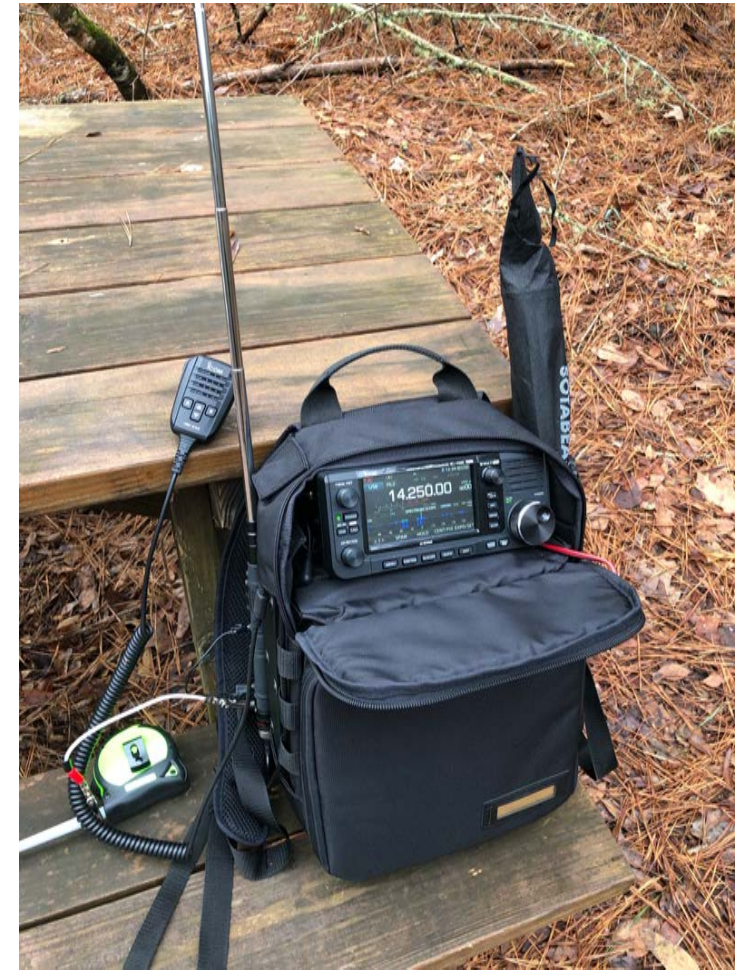
- Route planning – car, bike, hike, boat, etc.
- Maps - always have several formats
  - Print map (always good to have)
  - Digital map (I use Gaia GPS)
  - Park/property map (take a picture at the trailhead)
- Physical fitness – can you carry your own gear?
  - Maintain a base level of fitness
  - How fast and far can you go on foot? Be realistic.
- Creature comforts – food, water, chair, shelter
- Radio gear – primary and backup





# Portable radios & power

- Receivers
  - Portable radios – AM/FM/SW
  - Scanners – Trunking / Non-trunking
  - SDR – wide-band coverage, needs computer (or phone)
- Transceivers
  - HT – APRS, VHF, UHF (usually 5 watts or less)
  - Portable Rig – All-mode or HF-only (usually QRP)
  - Mobile Rig – All-mode or HF-only (up to 100w)
- Power – batteries
  - Battery packs
  - External batteries
  - AA / AAA batteries “clam shell”
  - Charging



*Icom IC-705*



*Yaesu FT-817*



# Portable antennas

- All-band
  - Loop
  - Longwire with tuner
- Band-specific
  - Yagi
  - Vertical
  - Dipole
  - End-Fed Dipole
- My favorites
  - HT Whip for casual VHF/UHF
  - Roll-up J-Pole for VHF/UHF
  - EFHW 10/20/40 for HF
  - Multi-band vertical for HF (although a challenge to tune)





# Developing your RF awareness

## Useful Non-Amateur Bands

AM Broadcast	550 kHz – 1.8 MHz
Shortwave Broadcast	3 MHz – 25 MHz
Low-band VHF	30 – 50 MHz
FM Broadcast	88 – 108 MHz
Aviation (AM & FM)	118 - 144 MHz
High-band VHF	148 – 174 MHz
Marine	156 – 158 MHz
NOAA Weather	162.4 – 162.55 MHz
Military Aviation	225 – 389 MHz
Government	406 – 420 MHz
UHF	450 – 470 MHz

Source: ARRL

## Fun things to monitor

- Public safety
- Park rangers
- CB radio
- Railroads
- GMRS / FRS / MURS
- Air bands
- Local businesses
- Fast-food drive thru
- LF beacons
- Shortwave broadcasters
- Pirate radio
- BCB AM radio DX
- Utility stations
- Decoding digital signals (SSTV, WX Fax)
- Satellites

## When work and on what band ?

	Layer	Day	Night	Summer	Winter	Min. Sun activity	Max. Sun activity
160 m	F		Yes		Yes	Yes	
80 m	F		Yes		Yes	Yes	
40 m	D,E,F2	Yes	Yes	(yes)	Yes	Yes	(yes)
30 m	D,E,F2	Yes	Yes	Yes	Yes	Yes	Yes
20 m	D,E,F,F2	Yes	(yes)	Yes	Yes	(yes)	Yes
17 m	D,E,F,F2	Yes	(yes)	Yes	(yes)		Yes
15 m	D,F,F2	Yes		Yes			Yes
12 m	D,F	Yes		Yes			Yes
10 m	D,E,F	Yes		Yes			Yes

Source: astrosurf.com



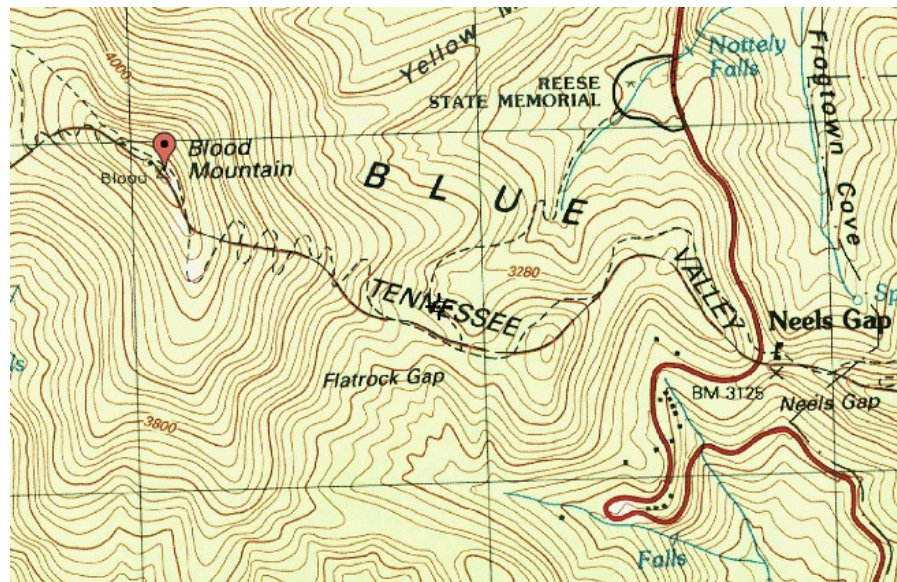


# Deployment scenario – SOTA

## Blood Mountain - W4G/NG-004



- Kenwood TH-D74 HT
- Yaesu FT-817
- Roll-up J-Pole for 2m
- “Trail friendly” EFHW 10/20/40 HF
- Bioenno 4ah LiFePo4 battery
- Bands worked
  - 2m – APRS & FM simplex
  - 20m / 40m SSB





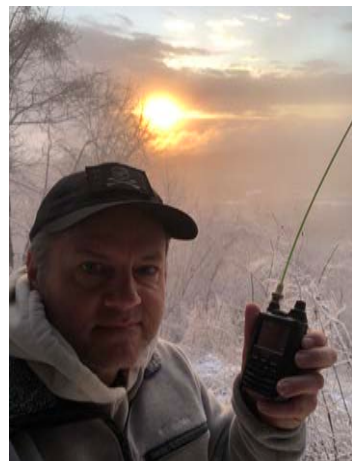
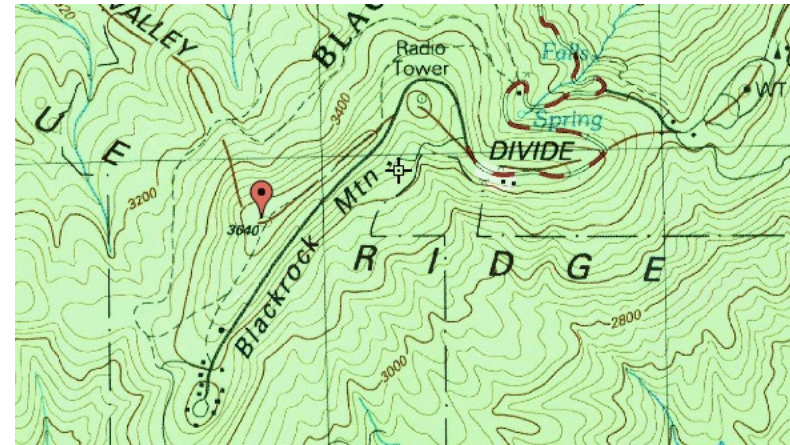
# Deployment scenario – SOTA/POTA

## Black Rock Mountain State Park

### W4G/NG-027 / K-2167



- Yaesu FT-3D HT
- Icom IC-705
- Signal stick whip antenna (2m)
- “Trail friendly” EFHW 10/20/40 HF
- Bioenno 4ah LiFePo4 battery
- Bands worked
  - 2m – APRS & FM simplex
  - 20m / 40m SSB

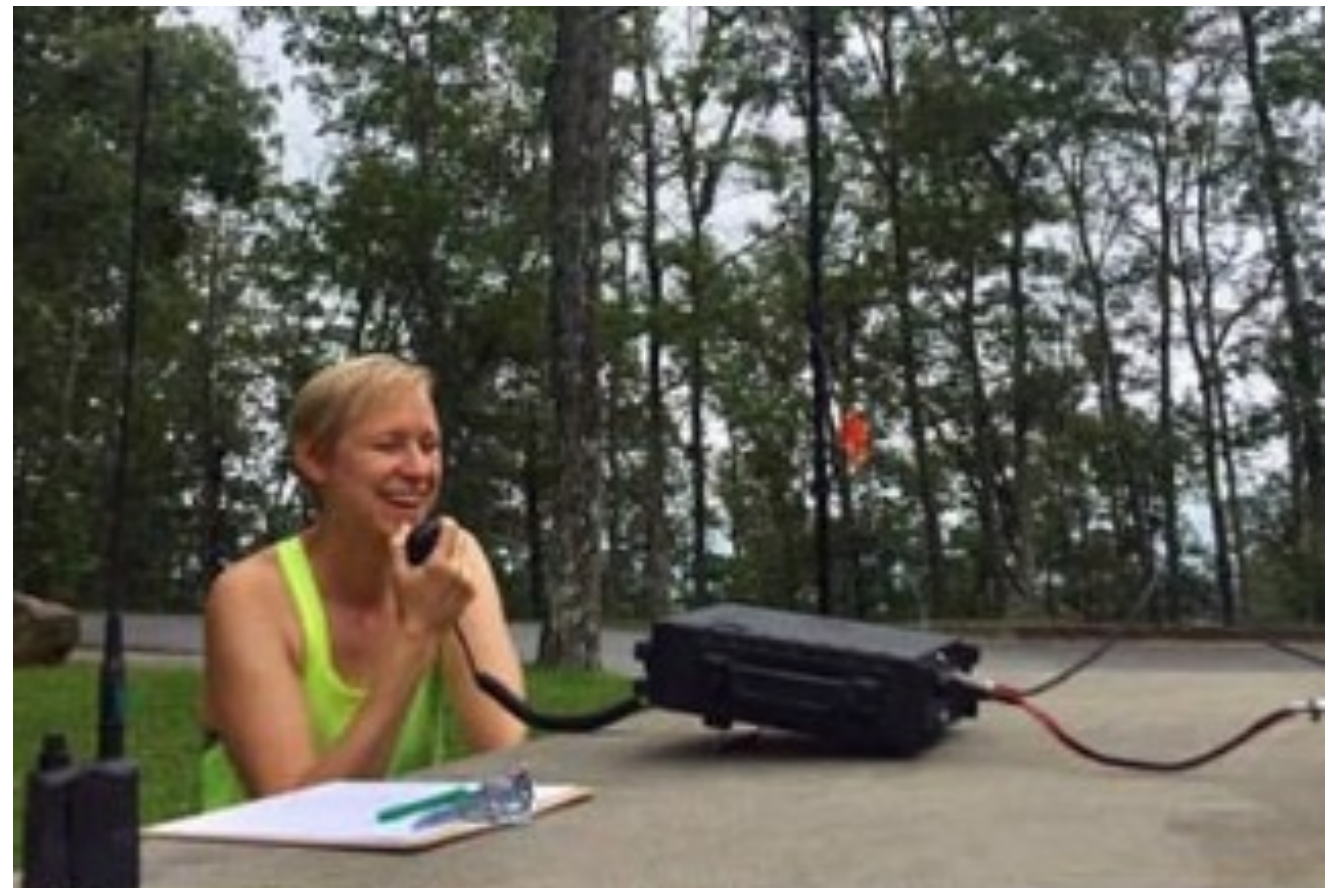
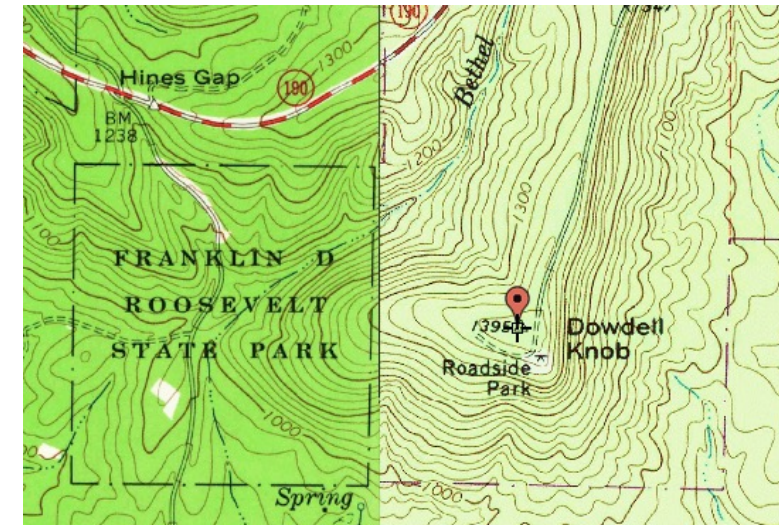




# Deployment scenario – POTA FDR State Park – K2173



- Yaesu FT-897 @ 100 watts
- Kenwood TH-D74 HT
- Deep cycle marine battery
- Buddipole antenna for HF
- Roll-up J-pole for VHF
- Operated 20m & 40m SSB
- Operated 2m FM simplex
- Location – Dowdell's Knob (also a SOTA peak)

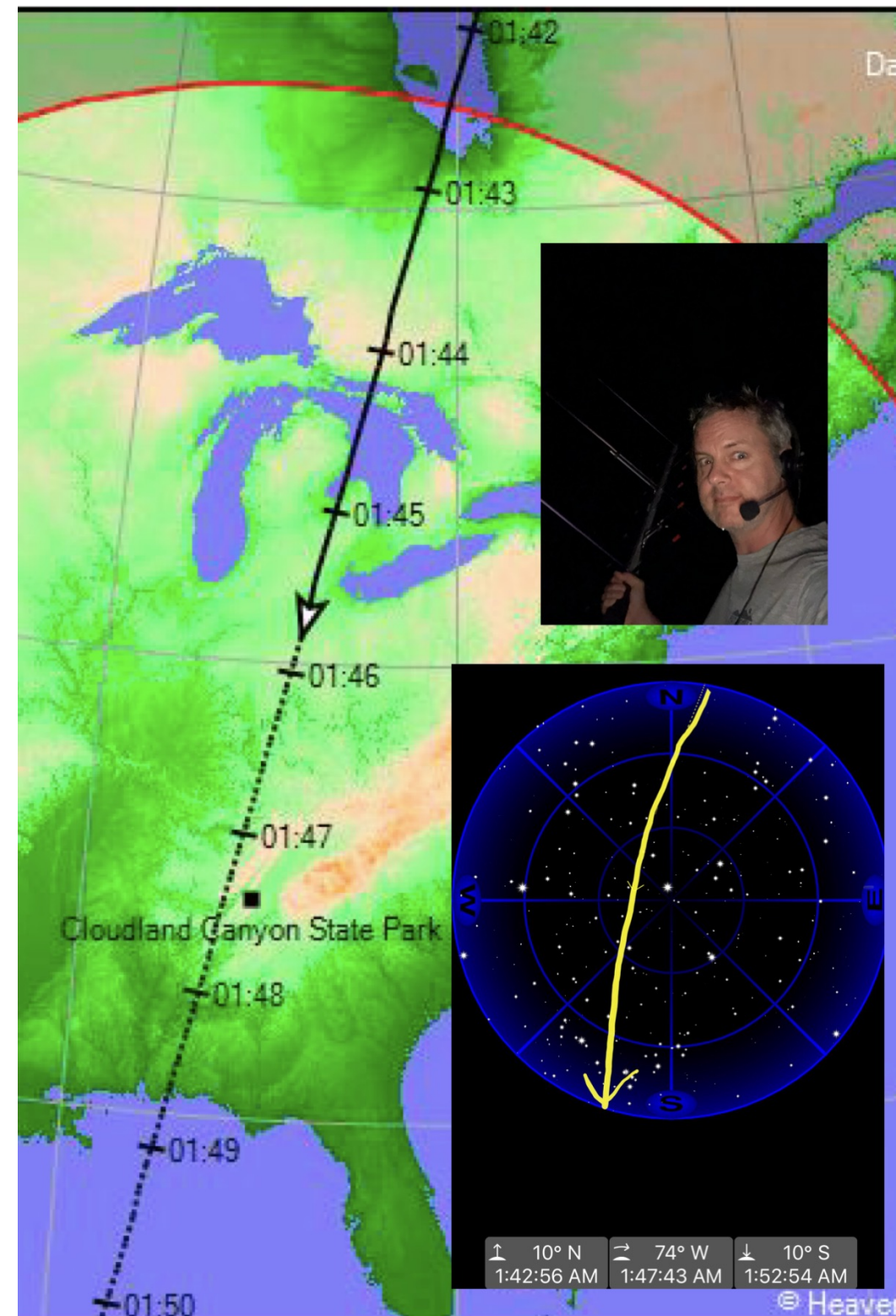




# Deployment scenario – ARRL Field Day 2020

## Cloudland Canyon State Park

- AMSAT AO-91 contact
- Arrow Yagi antenna – 2m/70cm
- Kenwood TH-D74 / Yaesu FT-3
- Grid square EM74
- [Contact with K4RGK & KJ4M](#)

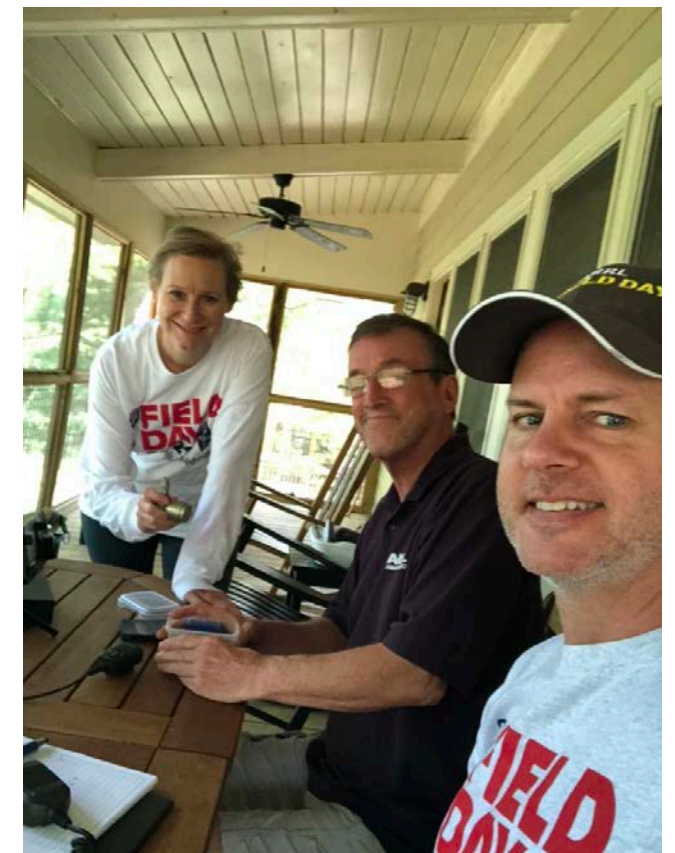
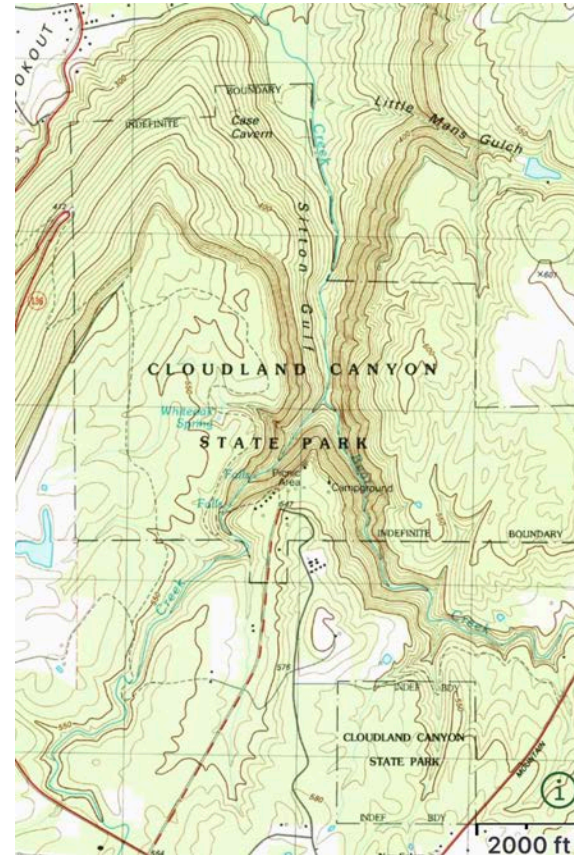




# Deployment scenario – ARRL Field Day 2021

## Cloudland Canyon State Park (revisited)

- POTA activation of K-2169
- SOTA activation of W4G/HC-022
- Arrow Yagi antenna – 2m/70cm
- Kenwood TH-D74 / Yaesu FT-3
- IC-705 (SOTA) / IC-7200 (POTA/FD)
- Grid square EM74
- [LilacSat-2 satellite QSO with KP4WC](#)

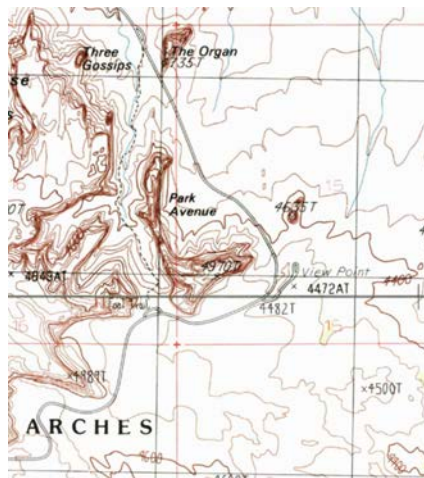




# Deployment scenario – POTA Arches National Park – K0004



- Icom IC-705 @ 10w
- Yaesu FT-3D HT
- “Trail friendly” EFHW 10/20/40 HF
- Bioenno 4ah LiFePo4 battery
- Bands worked
  - 2m – APRS & FM simplex
  - 20m / 40m SSB
- [QSO w/ KD4YDC back in GA!](#)



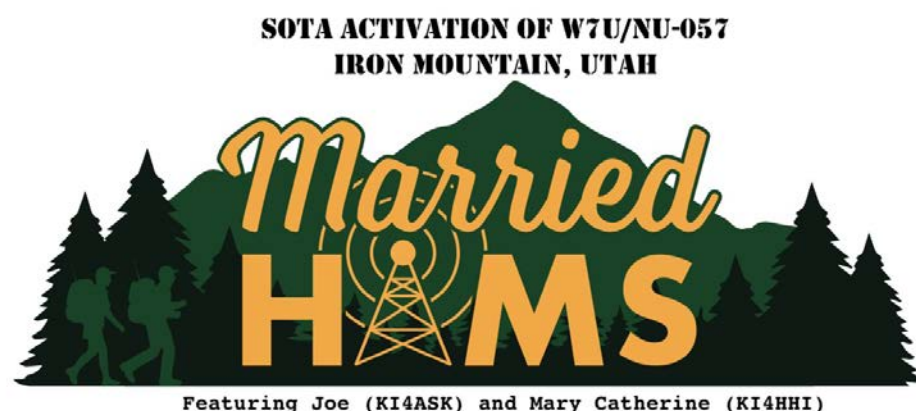
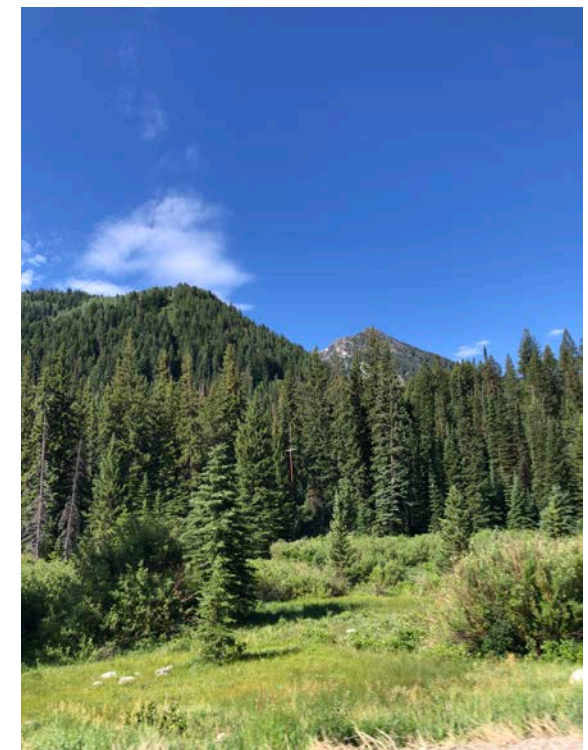
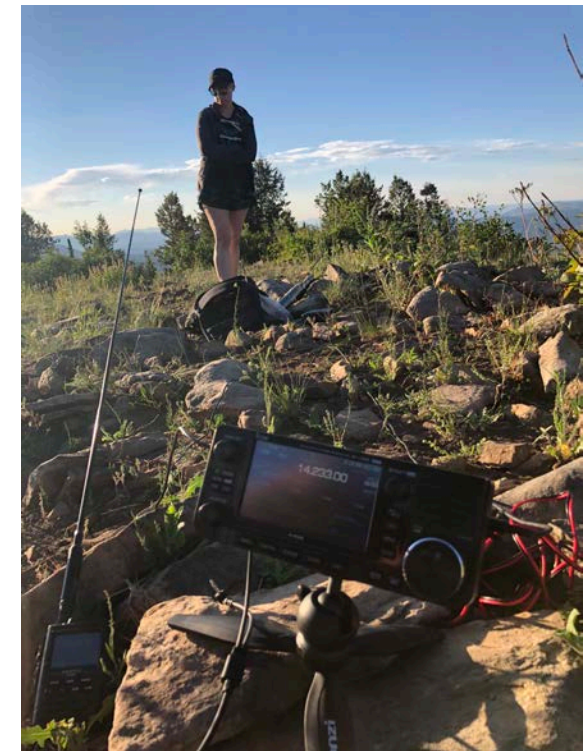


# Deployment scenario – SOTA

## Iron Mountain, UT – W7U/NU-057



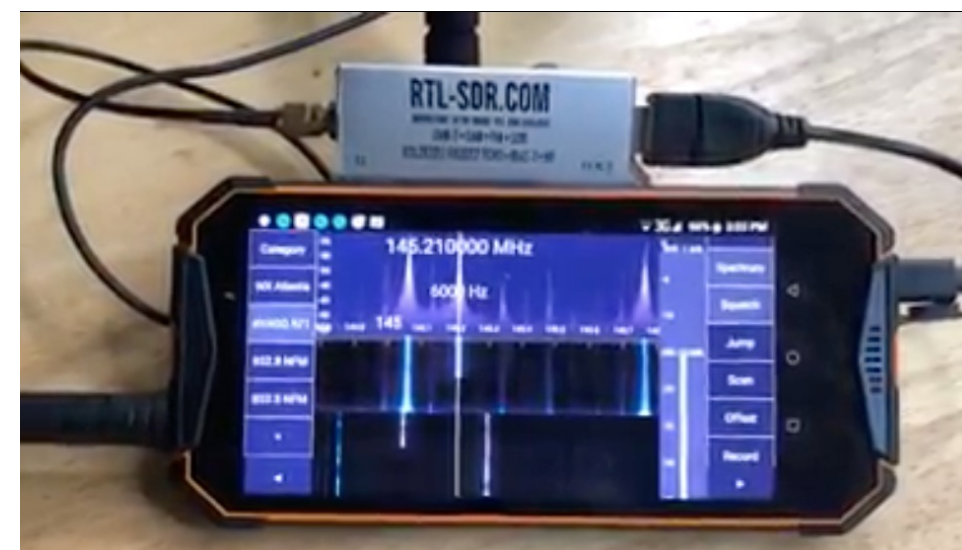
- Kenwood TH-D74 HT
- IC-705 @ 10w
- “Trail friendly” EFHW 10/20/40 HF
- Bioenno 4ah LiFePo4 battery
- Bands worked
  - 2m – APRS & FM simplex
  - 20m / 40m SSB
- [Married Hams - YouTube video of the activation \(7/6/21\)](#)





# Deployment scenario – Listening Post

- [Longwave NDB FFC – 2/14/2021](#)
  - AirSpy SDR on 316 kHz, Loop antenna, Windows tablet
- [SSTV decode – 12/26/2020](#)
  - Icom IC-R5 & SSTV app on iPhone
- [Pirate Radio – 10/31/2020](#)
  - IC-705 on 6.882 MHz
- [SSTV decode – 10/5/2020](#)
  - IC-705 & SSTV app on iPad
- [Air Force One on 127.900 – 7/15/2020](#)
  - Yaesu FT-3D
- [VHF Monitoring on 145.210 – 6/16/2019](#)
  - RTL-SDR & Android Phone

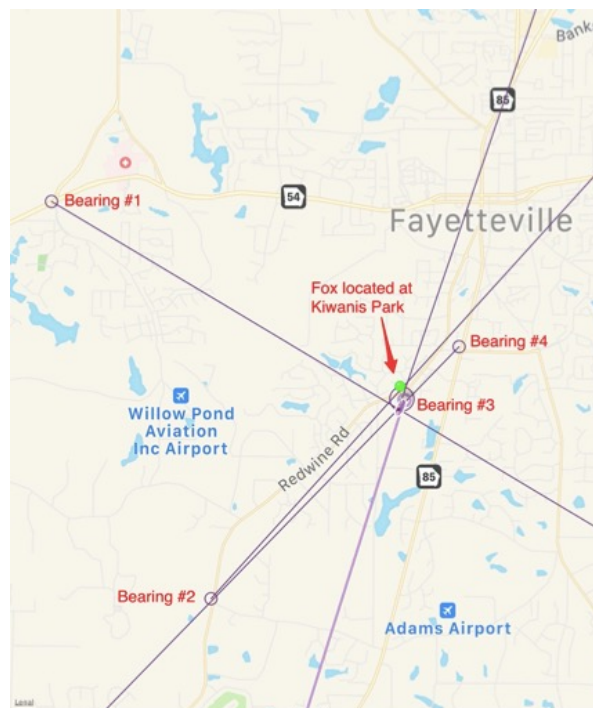
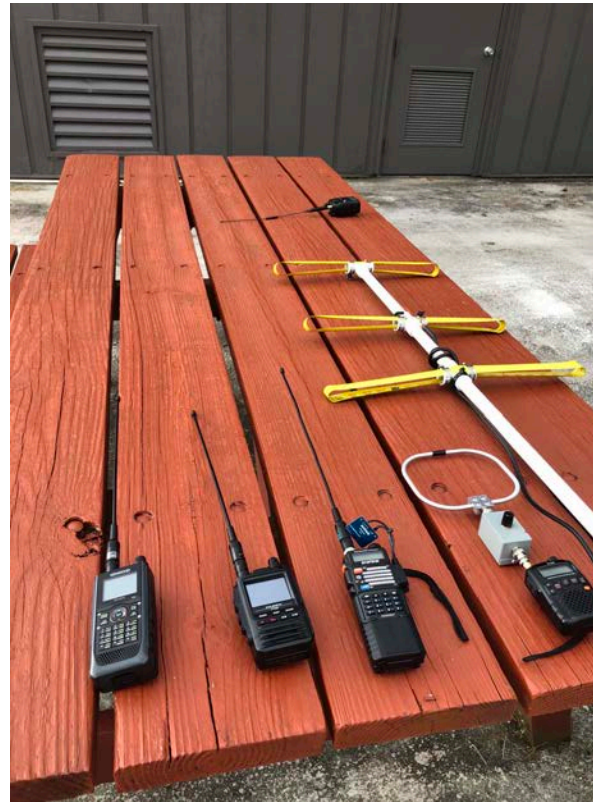




# Deployment scenario – Fox Hunting

- Goal – locate hidden radio transmitter (usually VHF)
- “Radio scavenger hunt”
- Gear
  - Radio receiver
  - Directional antenna – Yagi or loop
- Procedure
  1. Finding the signal
  2. Triangulating the source
  3. Attenuating & finding the fox

[Intro to Fox Hunting Presentation](#)





# Selected QRP Ham Radio Portable Contacts

- [20m SSB to VA3AAA – Stanley Island, Ontario, Canda – 1/2/2021](#)
- [20m SSB to W1GD – Boston, MA – 11/15/2020](#)
- [2m/70cm FM to XE1HG via AO-91 - Guadalajara, Jalisco Mexico – 11/14/2020](#)
- [20m to KF5CRF School Club Roundup, Mangum, OK – 10/19/2020](#)
- [40m to AD4PF – NW Memphis, TN – 10/14/2020](#)
- [6m to VA3CD – Niagra Falls, Canada – 6/21/2020](#)
- [10m to KD5AW – Oklahoma City, OK – 6/15/2020](#)
- [6m to WB1GQR – Essex, VT – 6/14/2020](#)



**Yankee Clipper Contest Club**

**MASSACHUSETTS**  
Grid FN42bi CQ 5 ITU 8 Worcester County

**W1GD**

Gerry Kersus  
201Kendall Rd  
Jefferson MA 01522  
USA

Confirming QSO With	Month	Day	Year	UTC	MHz	RST	2X Mode
KI4ASK	11	15	2020	1955	14	57	SSB

☐ PSE QSL ☒ TNX QSL

73, Gerry





# Suggested resources

- Introduction to Ham Radio by KI4HHI  
video - <https://youtu.be/0B4xPDxk3x4>  
slides - <https://kk4gq.org/pdf/PSYC-Ham-Radio-Presentation-Mary-Catherine-Domaleski-KI4HHI.pdf>
- Our “Married Hams” SOTA activation of Iron Mountain, UT (video) - <https://youtu.be/cqcSNogeLXA>
- SOTA - <https://www.sota.org.uk>
- POTA - <https://parksontheair.com>
- [\*Portable Operating for Amateur Radio\* by Stuart Thomas, KB1HQS](#) (book published by ARRL, 2018)
- Introduction to Fox Hunting (presentation)  
<https://kk4gq.org/pdf/FoxHunting101-ARDF-KI4ASK-April-2019.pdf>
- Introduction to Amateur Radio Satellites (presentation)  
<https://kk4gq.org/pdf/AMSAT101-Easy-Sats-KI4ASK-November-2019-web-version.pdf>
- Choosing a Ham Radio (ARRL)  
<https://www.arrl.org/files/file/On%20the%20Air/Choosing.pdf>
- Georgia ARES – <https://gaares.org>
- Georgia AuxComm - <https://gaauxcomm.org>





# Thank you!

Come see us at the 2021 [Huntsville Hamfest](#)  
*Forum – Portable Ops* on Saturday, 8/21 – 10am



Joe (KI4ASK) & Mary Catherine  
(KI4HHI) Domaleski

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